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REDUCTION OF POLLUTION RELEASES THROUGH AGRICULTURAL POLICY CHANGE AND DEMONSTRATIONS BY PILOT PROJECTS

Recommendations for BAP and introduction of
concepts for the application of BAP in the
lower DRB countries



WORKING FOR THE DANUBE AND ITS PEOPLE

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PREFACE

The overall objective of this Project is to the reduction of pollution from agriculture.

Within this Project there are two key specific objectives:

- > Agricultural Policy: Reduction of nutrients and other harmful substances from agricultural point and non-point sources through agricultural policy changes (referred to Output 1.2 in DRP's documentation); and,
- > Pilot Project(s): Development and implementation of pilot projects on reduction of nutrients and other harmful substances from agricultural point and non-point sources (referred to as Output 1.3).

The work will build on earlier studies and will improve the linkages to key EU policy instruments including, Water Framework Directive, Nitrates Directive and the Common Agricultural Policy etc., within the basin.

This Project is a continuation of work began in Phase 1 of the DRP, and the outputs and outcomes from this initial phase will be utilized and further developed in the project.

The Project will assist the DRB countries (especially in the lower Danube basin) with the development of pilot programmes for agricultural pollution reduction and low-input agriculture, in line with existing and emerging (driven by EU Accession) national environmental legislation.

The project addresses two DRP Outputs:

- > Agricultural Policy (DRP Output 1.2) and
- > Pilot Projects (DRP Output 1.3)

The following Tasks are included in the Project relating to Agricultural Policy:

- > Task 1: Analysis of Current Legislation and Enforcement
- > Task 2: Review of Agrochemical Inventories
- > Task 3: Best Agricultural Practice
- > Task 4: Dissemination of new Agricultural Pollution Reduction Concepts

The following Tasks are included in the Project relating to Pilot Projects:

- > Task 5: Preparing detailed work programme for Pilot Projects
- > Task 6: Implementing Agreed Pilot Project
- > Task 7: Pilot Project Training and Demonstration Workshops

This report addresses Task 3: Best Agricultural Practice.

The purpose is to develop concepts for the application of best agricultural practices (BAP) in the lower DRB countries. The Report should be seen as a supporting document for the training in BAP in the 7 Lower Danube Countries to be implemented by the Project partners in the countries.

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ABBREVIATIONS

BAP	Best Agricultural Practice
BAT	Best Available Technique
CGAP	Code of Good Agricultural Practices
daNUbs	Nutrient Management in the Danube Basin and its Impact on the Black Sea
DRB	Danube River Basin
DRP	Danube Regional Project
DRPC	Danube River Protection Convention
EG	Expert Group
EMIS EG	Expert Group on Emissions
EU	European Union
EU WFD	EU Water Framework Directive
GAEC	Good Agricultural and Environmental Condition
GAP	Good Agricultural Practice
GEF	Global Environment Facility
GFP	Good Farming Practice
GIS ESG	Expert Sub-group on Cartography and GIS
GIS	Geographical Information System
ICPDR	International Commission for the Protection of the Danube River
IPM	Integrated Pest Management
IPPC	Integrated Pollution Prevention and Control
MLIM EG	Expert Group on Monitoring, Laboratory and Information Management
MONERIS	Modelling Nutrient Emissions into River Systems
N	Nitrogen
OA	Organic Agriculture
PoM	Programme of Measures
P	Phosphorous
PPP	Plant Protection Products
RBM EG	Expert Group on River Basin Management
UNDP	United Nations Development Programme
RBMP	River Basin Management Plan
RR	Roof Report
SMR	Statutory Management Requirements
TNMN Trans	National Monitoring Network
WFD	Water Framework Directive
WB	World Bank

1. RECOMMENDATIONS FOR BEST AGRICULTURAL PRACTICE

During the project workshop on Dissemination of the Pilot Project's Results-Training of Trainers in Belgrade, 20.-23. 2. 2006, the Project has in dialogue with the project partners elaborated the following recommendations for BAP in the Lower DRB Countries:

General

- Getting the agricultural community actively and positively involved in reducing the environmental impact of agriculture by stressing the economic benefits for the farmers in the short and long term.
- Develop a national agro environmental programme (master plan) for diminishing pollution from agriculture.
- Develop a programme for cleaning up of old hazardous pollution from agriculture (manure, organic sediments in canals and rivers, collection of outdated agrochemicals and destruction of these).

Regulatory Instruments

- Adopt in principle all provision of the EU basic regulations for prevention of pollution of the environment from agriculture.
- Set national rules (provision and recommendations for Best Agricultural Practice) for storing and spreading of manure and agrochemicals (dates and maximum amounts).
- Adopt in the master plan and legislation principles of the EU basic regulations for prevention of pollution of the environment from agriculture. The master plan has to be seen in relation to or be a part of a Rural Development Programme.
 - The programme has to include different kinds of national support to agro-environmental measures (financial support to investments in agro-environment measures, training, and extension services).
 - The programme has to include fees or other kinds of punishment if producers are violating the different agro-environment provisions.
- Systematic implementation and enforcement of the legislation and provisions.
- Personal License to all using agrochemicals for pest control.
- Yearly mechanic control of field sprayers.
- Certification and control schemes for Organic/Ecological farming.

Economic Instruments

- Support schemes for investments in BAP, especially in storing capacity for manure and equipment for spreading manure.
- Support for restructuring, training and operation of the extension/advisory services. The restructuring should facilitate that private farmers will be involved in the farm advice system.
- Establishment of a fund for promotion of Organic/Ecological farming aiming at subsidizing farmers during conversion.

Advisory/Information

- Systematic training of civil servants, extension services, farmers and employers in the agricultural sector.
- Awareness rising among the public concerning the benefits for environment, nature, health and economy of environmental friendly agriculture (BAP).
- Awareness rising about Organic/Ecological farming among farmers, advisory services and agricultural scientific and research institutions.
- Revitalise knowledge of sustainable methodologies on manure management and crop rotation from pre-communist times for small farms (Subsistence farming).

Project Based

- Establish pilot projects and seminars showing the results of Best Agricultural Practise in all 7 lower Danube countries.

2. LINK TO PHASE 1 DRP ACTIVITIES

This report builds on the achievements of Phase 1 of the Danube Regional Project, especially the reports:

- Recommendations for Policy Reforms for the Introduction of Best Agricultural Practice (BAP) in the Central and Lower Danube River Basin Countries.
- Final Report for Danube Regional Project Outputs 1.2 & 1.3
- Workshop on Promoting Best Agricultural Practice in the Danube River Basin, 6 – 7 October 2003, Zagreb, Croatia
- Workshop on Developing Pilot Projects for the Promotion of Best Agricultural Practice in the Danube River Basin, 19 – 20 January 2004, Bucharest, Romania

This Project uses the same definition of Best Agricultural Practice as in Phase 1 of the Danube Regional Project: **“...the highest level of pollution control practice that any farmer can reasonably be expected to adopt when working within their own national, regional and/or local context in the Danube River Basin”**.

Focus in Phase 1 was on the use of agrochemicals. This Project considers in line with EU policies as well the handling of manure as a central issue in BAP implementation in the lower Danube countries.

3. THE PILOT PROJECT

This Project implements a Pilot Project in Srednji Banat, Vojvodina, Serbia.

Vojvodina was chosen as one of the Pilot Project locations identified in Phase 1 of the DRP as the area is intensively farmed with maize, wheat, sugar beets, soy beans, and other arable crops. Furthermore livestock production within the area is also representative for the region, especially pigs, dairy cattle and poultry production, which, consequently, produce a large quantity of organic manure as a potential source of pollution.

Nitrogen, phosphorus and plant protection products (PPP) are not only potential hazardous agents for the aquatic environment, they are also very costly and necessary inputs in agricultural production. Also manure from animal production is a valuable farm resource, if used correctly. Farmers, that are using resources like farm manure, commercial fertilizer and plant protection products efficiently therefore benefit economically from a better farm economy. At the same time helps efficient farm resource management to reduce pollution of water bodies from manure and PPPs.

It is impossible to do farming without leaching of nitrogen, phosphorus and PPP (except for organic farming, where no PPPs are used) and it is impossible to utilise farm resources with one hundred percent efficiency. It is, however, possible through Best Agricultural Practice to obtain a high efficiency of the farm resources nitrogen, phosphorus and PPPs and at the same time reduce environmental pollution from these inputs to a minimum.

The Pilot Project considers 15 BAPs which are considered the highest level of pollution control practice that any farmer can reasonably be expected to adopt when working within their own national, regional and/or local context in the Danube River Basin.

The BAPs for the Pilot Project can be grouped under the following headlines:

- General
- Crop production systems
- Livestock production systems
- Livestock density
- Livestock manure management
- Use of PPP

4. EU RULES AND REGULATIONS

4.1. Nitrates Directive: Code of Good Agricultural Practice

According Article 4 of the Nitrate Directive (Directive 91/676/EEC) Member States shall establish a Code of Good Agricultural Practice. Some examples of the provisions to be included are:

- periods when application of fertilizer is inappropriate;
- the capacity and construction of storage vessels for livestock manures;
- use of crop rotation systems;
- training and information of farmers, promoting the application of the Code of Good Agricultural Practice.

The Nitrate Directive further specifies (in ANNEX III: MEASURES TO BE INCLUDED IN ACTION PROGRAMMES): The specified amount per hectare be the amount of manure containing 170 kg N.

Comment:

The BAPs included in the Pilot Project relate to a great extent to the Nitrate Directive and include the provisions outlined above. The maximum amount of nitrogen from livestock manure that according the Nitrate Directive may be applied per hectare: 170 kg N/ha per year is only obligatory for the nitrate vulnerable zones, but this project recommends that it is used as a part of BAP for all agricultural land in the Danube catchment. In fact this Project interprets the provisions of the Nitrates Directive that all agricultural land in the catchment should vulnerable zones as the Black Sea coastal water body that receives the water from the Danube is subject to eutrophication due to nitrates.

4.2. Integrated Pollution Prevention and Control Directive

Best Available Technique (BAT) – determined by EU Directive on Integrated Pollution Prevention and Control (IPPC) (Directive 96/61/EC) – "shall mean the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole".

The agricultural enterprises included in the IPPC Directive are installations for the intensive rearing of poultry or pigs with more than:

- (a) 40 000 places for poultry
- (b) 2 000 places for production pigs (over 30 kg), or
- (c) 750 places for sows.

All new or substantially altered units for intensive animal production larger than the ones mentioned above require an operating permit that will detail the 'Best Available Technique' to control emissions.

Comment:

The IPPC Directive focuses on emissions from the installations which correspond to buildings for livestock production, and do not address the whole farm as a production unit, and its nutrient balance as it is the case of the Pilot Project BAPs.

However, it is a minimum condition to receive an IPPC approval that a farm complies with the provisions of the EU Nitrate Directive, whether situated within a Nitrate Vulnerable Zone or not, and Best Available Techniques would typically include technologies and techniques for handling, transport, storage and spreading of livestock manure; large nutrient balance figures would often be related to these matters.

4.3. Water Framework Directive

The administrative unit of the Water Framework Directive (Directive 2000/60/EC) is a functional unit of surface or ground water: the water body. The overall environmental objective of the Water Framework Directive is to achieve "good water status" throughout the EU by 2010 and for it to be maintained thereafter (some possibilities for derogation from this principle is defined in the Water Framework Directive and requires substantial argumentation). The Water Framework Directive requires that significant pressures have to be identified.

A significant pressure means any pressure that on its own, or in combination with other pressures, may lead to a failure to achieve the specified objective (good water status). If agricultural point sources or diffuse sources are identified as significant pressures, all water bodies in risk of not achieving good status due to environmental impact have to be identified. The risk assessment has to be confirmed by actual monitoring of the water bodies. If the monitoring confirms the risk, agricultural practices have to be changed in a way that makes it possible for the water body to achieve good status. A programme of measures, has to be established in order to achieve the objectives for the water bodies.

Comment:

The Water Framework Directive has an "ecosystem approach". Its programme of measures reflects the vulnerability of each water body, meaning that other or more measures addressing agriculture can be required to reach good status in addition to the BAPs included in the Pilot Project for the most vulnerable water bodies, e.g. lakes with a high percentage of intensive agriculture in their catchment.

But the programme of measures shall also take into account other Community legislation for the protection of water including the Nitrates Directive and the IPPC Directive.

4.4. Common Agricultural Policy

The main instrument for supporting farmers in the EU is the Common Agricultural Policy (CAP). This policy instrument continues to undergo a series of radical reforms that will impact upon all farmers in the EU. EU policies, and notably the Common Agricultural Policy, increasingly aim at heading off the risks of environmental degradation, while encouraging farmers to continue to play a positive role in the maintenance of the countryside and the environment by targeted rural development measures and by contributing to securing farming profitability in the different EU regions.

The agri-environmental strategy of the CAP is largely targeted at enhancing the sustainability of agro-ecosystems. The measures set out to address the integration of environmental concerns into the CAP encompass environmental requirements (cross-compliance), incentives integrated into the market and income policy, as well as targeted environmental measures that form part of the Rural Development Programmes (e.g. agri-environment schemes).

Central to the new approach are the concepts of 'cross-compliance', 'direct income support', 'good farming practice' and 'modulation'.

Cross-compliance

A key element of the reformed CAP is the single farm payment for EU farmers, independent of production; limited coupled elements may be maintained to avoid abandonment of production. This payment will be linked to the respect of environmental, food safety, animal and plant health and animal welfare standards, as well as the requirement to keep all farmland in good agricultural and environmental condition ("cross-compliance").

Direct income support

The 1999 CAP reform entailed a further shift from price support to direct payments, with payments becoming essentially direct income supports. This change was driven not only by the need to make the EU farm sector more competitive in the face of the increasingly open global trading regimes, but also by the need to respond better to society's concerns about the relationship between farming and the environment, by removing incentives to intensification of production processes.

Good farming practice

EU Member States have to define verifiable standards of Good Farming Practice (GFP) at regional or national level. The complexity of the relationship between agriculture and the environment – harmful and beneficial processes, diversity of local conditions and production systems – has conditioned the approach to environmental integration in the context of the CAP. Central to the understanding of this relationship is the principle of Good Farming Practice which corresponds to *the type of farming that a reasonable farmer would follow in the region concerned*. This includes at least compliance with the Community and the national environmental legislation. GFP entails, for example, *compliance with the requirements of the Nitrate Directive*. As regards the rural development policy, compliance with minimum environmental standards is a condition for eligibility for support under several different rural development measures, such as assistance for investments in agricultural holdings, setting-up of young farmers and improving the processing and marketing of agricultural products. Moreover, only environmental commitments above the reference level of Good Farming Practice may qualify for agri-environment payments. The support to less-favoured areas also requires the respect of the codes of GFP.

Comment:

The BAPs included in the Pilot Project would normally be part of Good Farming Practice.

Modulation

The Agenda 2000 CAP reform also introduced the possibility of a shift of support from market policy to measures contributing to environmentally benign practices. Thus, part of the contribution to farmers in direct payment may be made available by Member States to increase the budget available for agri-environmental measures. This concept, known as 'modulation', is a part of the horizontal regulation. The 2003 CAP reform includes modulation as a compulsory measure. Modulation started in 2005 with a rate of 3 %, increasing in two steps up to 5 %. Farmers receiving direct payments of up to EUR 5 000 will receive full reimbursement of modulation amounts. Modulation amounts will be allocated to Member States on the basis of objective criteria.

Financial Incentives for Pollution Control

The EU Rural Development Regulation 1257/1999 (the "second pillar" of the CAP) makes provisions for Member States to encourage more environmentally-friendly farming methods, including practices and actions that reduce the risk of agricultural pollution. This offers a good opportunity for supporting the control of nutrient pollution in those DRB countries joining the EU, by allowing them to develop EU co-financed schemes that:

- a) offer farmers grant-aided investment (up to 50%) in agricultural holdings that helps to “...preserve and improve the natural environment” – for example, by purchasing new manure storage facilities or purchasing more up-to-date equipment for fertiliser and manure application
- b) train farmers for the “...application of production practices compatible with the maintenance and enhancement of the landscape and the protection of the environment” – this includes:
- training for organic farming
 - training for farming management practices with a specific environmental protection objective
- c) introduce agri-environment schemes that offer area payments to support “...agricultural production methods designed to protect the environment and to maintain the countryside” – this is a very important tool for supporting the adoption of organic farming, as well other pollution control techniques such as uncultivated buffer strips, conversion of arable to pasture land and the introduction of more diverse crop rotation patterns.

In Romania and Bulgaria, financial assistance is available for developing and implementing “pilot” agri-environment measures with SAPARD co-funding – the Special Pre-accession Programme for Agriculture and Rural Development.

Additionally, following the agreement on proposals arising from the recent Mid-term Review of the CAP a new “meeting EU standards” measure will be introduced to “help farmers adapt to the introduction of demanding standards based on EU legislation...concerning the environment, public, animal and plant health, animal welfare and occupational safety”. This is potentially a very useful tool for reducing pollution and some of the acceding countries are proposing to make extensive use of it to improve manure storage and management facilities on farms.

5. CONCEPT OF BEST AGRICULTURAL PRACTICE (BAP)

Some definitions of related terms that all are connected to EU legislation:

- **Code of Good Agricultural Practices (CGAP)**, which has connection to EU's Nitrate Directive (676/91/EEC) and which only relates to nitrogen
- Common Standards of **Good Farming Practice (GFP)** - determined by Council Regulation 1257/1999/EEC (provisions concerning support for rural development under the EAGGF), which determines that member states have to formulate "good farm practice" standards in their Rural Development Plan 2004-2006
- **Statutory Management Requirements (SMR)** - determined by EU Regulation 1782/2003/EEC, and is a set of 18 EU directives in the area of nature, agri-environment, food safety and animal welfare
- **Good Agricultural and Environmental Condition (GAEC)** - determined by EU Regulation 1782/2003/EEC, and are regionally determined measures, which the farmers must observe concerning minimum standards for land management
- **Best Available Technique (BAT)** - determined by EU's Directive on Integrated Pollution Prevention and Control (IPPC) Directive 61/96/EEC - "shall mean the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing in principle the basis for emission limit values designed to prevent and, where that is not practicable, generally to reduce emissions and the impact on the environment as a whole"

5.1. DRP Phase 1 Approach to Best Agricultural Practice

The following section is an abstract from the DRP phase 1 report. 'Recommendations for Policy Reforms and for the Introduction of Best Agricultural Practice (BAP) in the Central and Lower Danube River Basin Countries'.

Good/best practices for agriculture have been under development for many years. Stakeholders involved in the development of good/best practices typically include governmental and non-governmental organisations, farmers, consumers, food processors and retailers etc. – all of who seek to meet a variety of objectives for food quality, production efficiency, rural livelihoods and environmental benefits. The definition of good/best practices offers a means for these different stakeholders to promote their objectives within a clear framework that communicates the best available knowledge on a particular issue or issues. For example, a growing number of food processors and retailers increasingly require farmers to follow Codes of Practice for the production of fresh fruit and vegetables, cereal crops and livestock in order to achieve their required standards for quality assurance, consumer satisfaction and profit.

The general concept of good/best practice is also an increasingly important part of introducing and maintaining minimum environmental standards as the basis of promoting more sustainable agricultural systems. Such environmental standards are becoming a key part of the European model of agriculture due to international trade agreements, public environmental concerns and market forces. They are necessary to ensure minimum environmental protection on farmland and comparable production conditions (preventing uneven competition) across Europe.

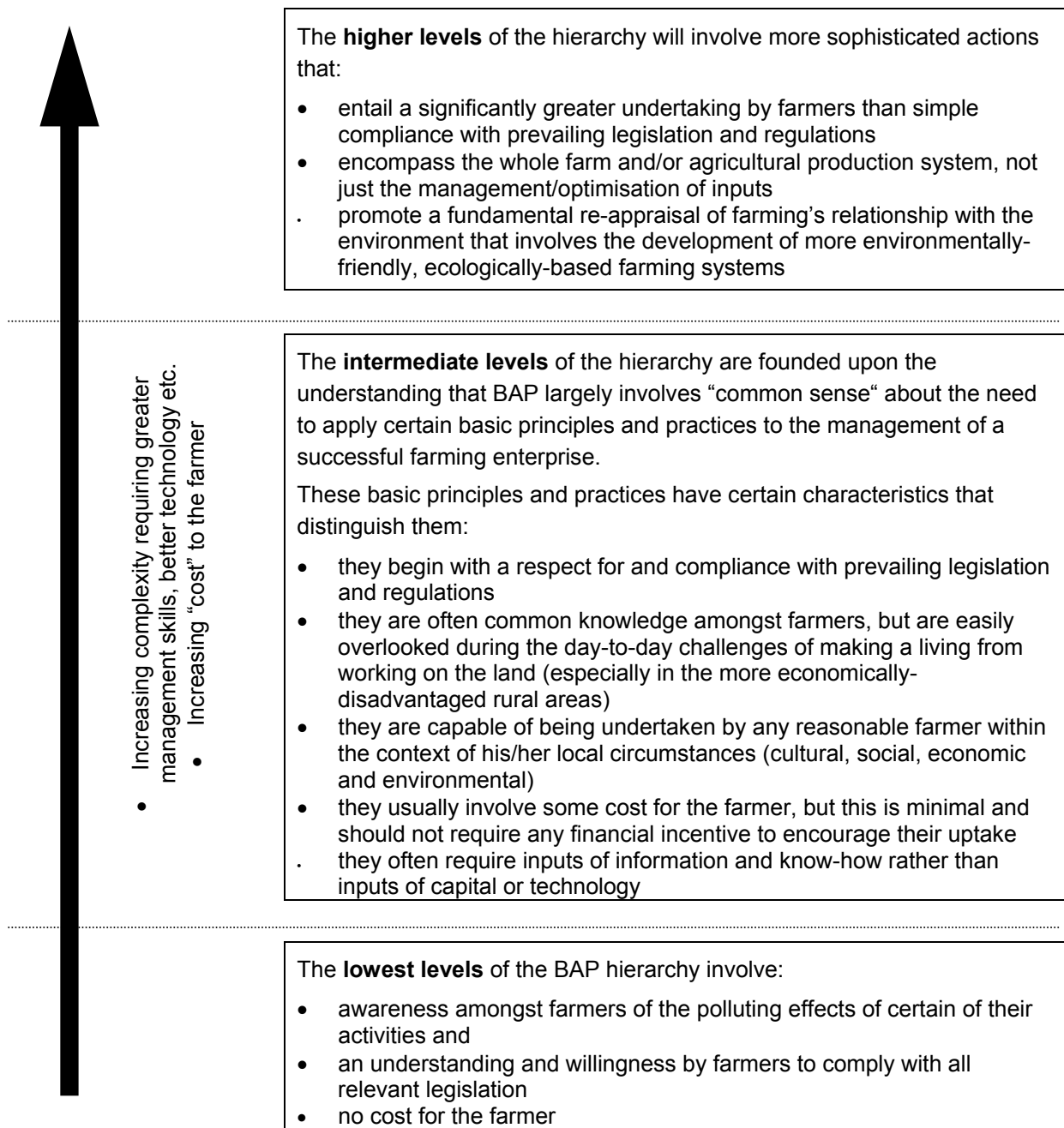
Different countries implement such minimum environmental standards in various ways using a variety of different policy measures and instruments, but conceptually there are three main levels of environmental performance in agriculture that relate to good/best practice:

“Red Zone”	These are the practices by farmers that are considered unacceptable and therefore commonly prohibited by law to protect natural resources, human health etc.
“Blue Zone”	This includes the minimum level of environmental management that it is considered “reasonable” to expect a farmer to undertake as part of “usual” farm management and without expecting any form of compensation/financial assistance. There are significant variations in the way that “good practice” is defined in different countries, but it is likely to include respect for environmental legislation (i.e. avoidance of the “red zone”), following advice from extension services, taking into account scientific and technical progress etc.
“Green Zone”	This involves a higher level of environmental management practice that delivers greater environmental benefit, but usually at greater “cost” to the farmer which may require some form of compensatory payment

The objective of developing a concept of Best Agricultural Practice (BAP) under Output 1.2 in Phase I was to support the design of new agricultural pollution control policies for the central and lower DRB countries – as well as encouraging compliance with existing and emerging national legislation (including that driven in many countries by the process of EU accession) – that will promote the greater integration of pollution control considerations into the day-to-day management of crops, animals and agricultural land by farmers in the central and lower DRB.

There are no concrete and universal definitions available for what is or is not Best Agricultural Practice – indeed, there is a risk that it is a potentially confusing term because it is prone to being interpreted by different people in many different ways. For example, in the context of the DRB it is important to clearly distinguish between the concept of BAP and the existing EU concepts of Codes of Good Agricultural Practice (GAP) under the EU Nitrate Directive and verifiable standards of Good Farming Practice (GFP) under the EC Rural Development Regulation 1257/1999.

A strict or prescriptive definition of BAP has been avoided in this project – instead we have proceeded with the understanding as described in the report of Phase I Recommendations for Policy Reforms for the Introduction of Best Agricultural Practice (BAP) in Central and Lower Danube River Basin Countries that BAP actually encompasses a broad spectrum or **hierarchy of activities** that must be interpreted according to local agronomic, environmental, social and economic context. It is this hierarchy of activities that forms a clear and common concept for BAP throughout the DRB countries as shown below:



Obviously not all elements of this hierarchy are relevant in all countries of lower DRB – there has to be some interpretation according to local context. To be effective, any BAP must not only be technically and economically feasible, it must also be socially acceptable to the farming community. For example, the social and economic circumstances of many rural communities in Moldova are very difficult and this will inevitably limit the ability of farmers to adopt the full BAP hierarchy above – indeed, even basic action such as ensuring that manure is collected and returned to the land rather than discarded in the village rubbish dump with other household waste can be difficult to encourage when local farmers cannot afford the cost of transporting manure to their fields.

On the other hand, in Bulgaria we might expect the more commercially-orientated farmers there to have the willingness and ability to prepare a “whole farm waste management plan” and to make

the necessary calculations for restricting manure application to the need depending on soil N supply etc. When viewed like this, the proposed concept of Best Agricultural Practice is quite straightforward and easy to define as:

“...the highest level of pollution control practice that any farmer can reasonably be expected to adopt when working within their own national, regional and/or local context in the Danube River Basin”

As such, BAP can be applied as a uniform concept across the whole DRB, but the level of environmental management/performance that can be expected from farmers in different regions/countries will vary significantly according to:

- a) the agronomic, environmental and socio-economic context in which they are operating
- b) the availability of appropriate policy instruments for encouraging farmers to “move up” the hierarchy and adopt more demanding pollution control practices
- c) the availability of appropriate knowledge and other technical resources for supporting farmers to “move up” the hierarchy and adopt more demanding pollution control practices.

5.2. Best Agricultural Practice and the Pilot Project

For the Pilot Project we adopted the above definition of Best Agricultural Practice (BAP) as described in the report on ‘Recommendations for Policy Reforms and for the Introduction of Best Agricultural Practice (BAP) in the Central and Lower Danube River Basin Countries’ of Phase I.

The project has defined 15 BAPs, which in combination are expected to have a strong effect on improving farm economy as well as minimizing environmental pollution from agriculture in relation to nitrogen, phosphorus and PPPs. Because of the positive economic effect of applying these BAPs it is anticipated that their introduction will be sustainable.

The BAPs for the Pilot Project have been formulated on basis of the Phase I report Recommendations for Policy Reforms and for the Introduction of Best Agricultural Practice (BAP) in the Central and Lower Danube River Basin Countries. The defined 15 BAPs do not attempt to be exhaustive but rather basic BAPs from the “Blue Zone” and “Green Zone” of environmental performance. The BAPs were selected to address typical issues related to the situation of the farms included in the Pilot Project while at the same time being relevant for all 7 project countries. The defined BAPs are focusing on farm level activities and addressing farmers and agricultural advisors as prospective applicants of these BAPs.

The 15 BAPs include recommendations on the lower, intermediate and higher levels of the hierarchy of activities as outlined in Phase 1 and form a common concept for BAP throughout the DRB countries. It is the approach of This Project that to address the issues in the lower and intermediate part of the phase BAP hierarchy it is necessary to include the issues from the highest level of the hierarchy.

The 15 BAPs can be grouped under the following headlines:

- General
- Crop production systems
- Livestock production systems
- Livestock density
- Livestock manure management
- Use of Pesticides

General

1. There should on all farms above 5 ha and/or 5 livestock be calculated resource economy every year, latest 1 April for the preceding year, and covering at least the resource economy for N, P and PPP.

Crop production systems

2. Every farm with at least 1 ha of arable crops should ensure soil sampling at least each 5 years.

3. Crop rotation and fertilising plans should be prepared for all farms above 5 ha every year latest 31 March, for winter crops latest 1 August. Fertilising plans shall be based on the expected yield level, the needs of the crops, and include both livestock manure and mineral fertiliser.

Livestock production systems

4. Livestock should be fed with rations that are correct balanced with energy, protein and minerals in relation to the productivity.

5. Cleaning of stables with water should be avoided or reduced to a minimum.

6. Watering of the livestock should happen in a way that hinders spill of water.

Livestock density

7. There should maximally be livestock corresponding to a nitrogen content in the manure of 170 kg N per ha. Manure should be sold to other farms or distributed to fields of other farms in case of a higher livestock density.

Livestock manure management

8. There should be storage capacity for at least 6 months production of livestock manure at the farm. Production systems with use of bedding material needs storage capacity for both liquid and solid manure. Production systems with deep bedding can store the manure on the field for up to 6 months if the manure has a dry matter content of minimum 30%.

9. It must be hindered that rain water can dilute the livestock manure.

10. Spreading of manure in the period from 15 October till 1 March should not take place, and in any case not on to frozen land or land with a slope of more than 7°.

11. Proper technology should be used for spreading of livestock manure. Liquid manure and slurry should be spread with band laying system or be injected into the soil.

12. Livestock manure should be incorporated into the soil within 6 hours.

Use of pesticides or Plant Protection Products (PPP)

13. Spraying should be done according to the needs, and the doses take into consideration the spraying time, the development stage of the crop, the climatic conditions.

14. The spraying equipment should function properly, and it shall be ensured that the nozzles are functioning well to ensure an even spraying.

15. Plant Protection Products shall be kept in a locked store, where books are kept on the purchase and use of PPP.

Preconditions

To implement the BAPs that constitute the Pilot Project in the 7 lower Danube Countries the following minimum conditions have to be met:

- Effective and affordable advisory service able to work in close dialogue with the farmers;
- Support schemes for storage capacity for at least 6 months production of livestock manure and equipment for bringing out the manure.

6. COUNTRY-SPECIFIC TRADITIONAL, SOCIAL AND ECONOMIC ISSUES

The concept for the application of Best Agricultural Practices (BAP) in the lower DRB countries takes into account country-specific traditional, social and economic issues related to agricultural practice as outlined below for the countries.

6.1. Bosnia & Herzegovina

In the DRP Phase 1 Workshop on Promoting Best Agricultural Practice in the Danube River Basin, 6 – 7 October 2003, Zagreb, Croatia the following was stated on the situation in Bosnia & Herzegovina:

- Ownership of land is highly fragmented
- Political structure is very complex with central government plus total of 12 regional governments each with ministries of agriculture and environment. Agricultural pollution is not a high priority and there are no clear mechanisms for communicating information on the risks of agricultural pollution or the development of new policy-making approaches
- There is no rural development policy – this is a key issue since agricultural pollution is closely linked to rural development
- There are no funds for research into the causes and control of agricultural pollution
- There is no framework for the development and implementation of agricultural pollution control – there is urgent need for institutional reform and capacity building
- Access to information on the causes of agricultural pollution and the practical measures and policy options for controlling pollution is very poor
- Co-ordination of donors needs to be improved is required to make best use of the limited resources available.

In a country specific policy review in Phase I it was stated in the report on Recommendations for Policy Reforms and for the Introduction of Best Agricultural Practice (BAP) in the Central and Lower Danube River Basin Countries that the pollution issue is not actually considered a serious enough problem by the authorities implementing the Water Law of Bosnia & Herzegovina. After adoption of the relevant sub-laws, the problem could be that farmers will not be able to pay imposed penalties for breaking laws. It is further mentioned in the report that inadequate mechanisms for controlling and monitoring of agricultural pollution and the lacking financial resources for monitoring are reasons for poor implementation of environmental protection laws concerning pollution of waters in Bosnia & Herzegovina.

6.2. Bulgaria

According to the country specific policy review in Phase I reported in Recommendations for Policy Reforms and for the Introduction of Best Agricultural Practice (BAP) in the Central and Lower Danube River Basin Countries several water polluting farming practices are discouraged by a system of penalties and fines. Discouraged local practices are for example:

Fine, or respectively estate sanction is imposed on natural or legal entity that pollutes the coastal areas, which could be potentially flooded and violates the following restrictions: Storage of pesticides, fertilizers pesticides, disposal and treatment of wastes; building of livestock farms; construction of buildings. However, not enough personnel in the Regional inspectorates of environment and waters is available to ensure compliance with the law.

Farming practices encouraged by economic instruments are for example: Land owners and land users have the right to certain tax or credit preferences when they apply: the obligatory restriction for the usage of the agricultural lands; the recommendations for preservation of the surface layer and its ecological functions; systems for organic agriculture and agriculture with reduced use of pesticides and fertilizers and more.

Several existing possibilities for Bulgarian farmers to avail support to investment in agriculture are mentioned in the National Report – Bulgaria: Analysis of Current Legislation and Enforcement, Fertilizer, Manure, Pesticides, like for example:

- Storage capacity for manure from animals through SAPARD programme
- Renovation and construction of new farm buildings for animals, machinery, storage of grain and animal feeds through SAPARD (Investments in agricultural farms) and Animal breeding programme
- Machinery for spreading of solid and liquid manure, field spreaders and other equipment related to the use of pesticides through Agricultural machinery programme.

6.3. Croatia

In the report to this project on Analysis of Current Legislation and Enforcement in Croatia, November 2005, it is stated:

Croatia has made efforts on setting up an agency to implement the Special pre-Accession Programme for Agriculture and Rural Development (SAPARD), which has to be strengthened so as to ensure it becomes operational according to the timetable agreed by the Croatian Government. Only limited progress can be reported with regard to preparations for the Integrated Administration and Control System (IACS), the management of common market organisations, and rural development activities. Overall, while Croatia has made some efforts, preparations for setting up the basic instruments for managing the Common Agricultural Policy are at an early stage.

The Croatian agricultural sector is still confronted with important structural problems, notably land fragmentation and difficulties with the functioning of the land market. Privatisation of state-owned land has progressed but is not yet complete. Croatia should speed up structural changes concerning land policy, rural development policy and diversification of farm activities in order to promote competitive farms. Due attention should be paid to strengthening administrative and management capacity within the Ministry of Agriculture, Forestry and Water Management. In the area of rural development preparations are at an early stage and limited developments took place.

According to the Review of Water Pollution Control Policy and Practice in Croatia (described in the report Recommendations for Policy Reforms and for the Introduction of Best Agricultural Practice (BAP) in the Central and Lower Danube River Basin Countries) because of rather low number of livestock in Croatia, total annual production of manure should not be considered as dangerous for water pollution at the moment. Small-size farms produce the majority of manure in Croatia and utilize it on their own agricultural land. On the other side, these small farms often have problems with storage capacities for the manure, and can therefore be a source of pollution for surface

waters. The most important problems for water management originate from several high capacity livestock farms.

Strategic recommendations of the Croatian authorities are therefore directed towards improving the storage capacities for manure and slurry and ensuring safety zones in which manure shouldn't be applied. In Croatia there are no exact statistics on pesticide consumption, but estimations show that the current consumption of pesticides per hectare is about 2.5 times lower than those in EU countries. The assortment of pesticides used is similar with EU's, so distribution licences have only those pesticides that are commonly used in EU. However, due to low average level of farmers' knowledge about pesticide use, there is increased danger of local contaminations caused by human mistakes in Croatia.

The Croatian Law on environment protection (NN 82/1994, 128/1999) contains suggestions for tax and tariff privileges in case of using environmental friendly production procedures, production and distribution practices (to be regulated by separate legislation). Implementation of the law, however is low, because the definition of emissions harmful for the environment are too general. In other cases of laws connected to farming practice in Croatia, implementation is low, because farmers are not informed about the laws.

6.4. Moldova

A rather comprehensive overview about country-specific traditional, social and economic issues constraining the implementation of environmental legislation in Moldova were pointed out in the report on Moldovan Legislation and Review of Agrochemical Inventories, October-November 2005, submitted to this project as follows:

The legal framework for agricultural pollution control exists and is fairly well developed in Moldova. The fact that in Moldova many laws were all developed over a short period of time generated a situation in which some laws contradict each other. Because the process of amendment of old laws as required for them to be in line with the new ones or with certain provisions of bilateral and multilateral agreement lags behind, confusion is created within authorities responsible for their enforcement and among farmers.

According to the report the enforcement of laws is rather low due to a number of relevant factors including:

- inherited tradition of disrespect to law,
- the ever changing laws, regulations, standards, guidelines,
- conflict of some laws, low dissemination of laws' contents among farmers,
- low quality mix of tools devised for enforcement of relevant laws,
- prohibitive rather than motivating spirit of the laws,
- low institutional capacity of relevant agencies,
- low monitoring capacities of relevant agencies,
- poor training of the local staff of relevant agencies,
- poor communication between relevant agencies,
- low capacities for extension in agriculture,
- consequences of the Guillotine Law,

- lack of agri-environmental practices,
- lack of BAP guidelines,
- lack of rural development approaches to solution of agricultural pollution problems in the rural areas.

Some infringements that were overlooked during the Soviet regime are still being overlooked by modern authorities, such as illegal cultivation of crops on small patches in protected and riparian areas which contribute to pollution of rivers and lakes.

The individual Moldovan farmers having problems in finding seeds, chemicals, having no agricultural technique and no transportation facilities to deliver their produce to markets, no sales experience, as well as a lot of other problems dealing with the lack of the necessary infrastructure in villages, lack of services for repair of technique and lack of consulting services, bear losses and get disappointed in their work. Fragmentation of land holdings is prevalent, affecting farm size viability.

Although each family grows a number of crops, true diversification of crops in agriculture with the respective market niches does not exist due to the subsistence form of farming, where the farmer needs to grow fodder for a few cattle and most food stuff for the family since no hope exists of some cash income to purchase them. The extra produce is sold spontaneously in the local markets.

The lack of knowledge about chemicals made for their spreading in the past by inadequate means. For instance a universal practice of spreading DDT on individual plots and even on collective farm agricultural surfaces was to put the powder into a nylon stocking and to carry and shake it along and over each row of potatoes or tomatoes. A current practice used by many small farmers is to go along the row of plants and to pour granulated mineral nutrients straight from the sack. Thus, nobody can be certain about the dose or amount applied. The lack of up-to-date equipment for spreading of chemicals conducts to frequent discharge of the chemical products in unintended sites or doses. The spreading equipment is frequently being washed in local rivers, lakes, or in proximity of fields, livestock and households.

All the above problems are exacerbated by poverty in rural areas.

In addition to these obstacles, in the DRP Phase 1 Workshop on Promoting Best Agricultural Practice in the Danube River Basin, 6 – 7 October 2003, Zagreb, Croatia it was additionally mentioned for the situation in Moldova that:

- highly fragmented patterns of landownership are a major obstacle to introducing good practice,
- much greater co-ordination of donors is required to make best use of the limited resources available,
- good potential for organic farming is existing, but there is no legislation or institutional structure to implement it.

6.5. Romania

According to the country specific policy review in Phase I reported in Recommendations for Policy Reforms and for the Introduction of Best Agricultural Practice (BAP) in the Central and Lower Danube River Basin Countries several water polluting farming practices are discouraged by a system of penalties and fines. Discouraged local practices are for example:

- Melting of linden, flax, hemp or other textile plants without permit or authorisation at the places not specially designed and equipped for these purposes;
- Storage of any type of fertiliser or PPPs on river beds or banks of water flows, water channels, dams, lakes, ponds and see-wall or in protected areas;
- Washing in water flows, lakes and their beds of animals disinfected with toxic substances or packages which contain pesticides or other dangerous substances;
- Grazing of livestock within protected areas of water flows;
- Storage and using of pesticides, nutrients or other toxic and dangerous substances within protected areas;
- burning the stubble, rush, bushes or vegetation on protected areas.

It is mentioned in the same report, however, that the Romanian administration lacks the financial resources to fully implement a penalty system and the staff to control the observance of laws.

6.6. Serbia

In the course of this project a Pilot Project is implemented in Srednji Banat, Vojvodina, Serbia. About the use of agrochemicals and manure on the Pilot Project farms the following observations are reported:

Manure

The Pilot Project farms have generally inadequate management of manure. The problem with manure is, however more expressed on large pig farms and one large cattle farm. They usually do not have or have insufficient storing place for slurry/manure. They treat slurry/manure on their farm as waste and trouble, although all of them have crop production for which this material is valuable. Most of them have just basic machinery for distribution of manure/slurry which is spreading it on the surface, without incorporating.

Smaller farmers usually do not care at all about manure, but just store it somewhere in the yard without special treatment. Only one small farmer is storing manure more carefully by piling it on one place, still not protected from effluents, but at least organised. This practice actually remained from a period when he had vegetable production and learned to use and exploit manure properly.

Farmers generally do not plan the use of manure, but try to get rid of it once their storing capacities are full (pig farms). This means they are spreading manure throughout the year or in autumn before seeding wheat (cattle farms). Quantities of distributed manure is not calculated in order to provide proper nutrient balance, but distributed on different fields every year to respond to the generally accepted rule to have it on a more productive field every five years for the purpose of improving the soil structure.

The pilot farms are typical examples of mismanagement of manure and organic waste in general. These farms are polluting the environment as much as losing money on bad balancing of nutrients. Most of the mistakes are deriving from lack of knowledge, the rest from lack of money for investments in machinery and buildings, but also from bad organisation of work on the farm and the lack of strategic and operative planning, lack of cooperation between small farms and lack of understanding the mutual benefits which might derive from it.

Chemical fertiliser

Utilisation of chemical fertilisers is widespread and all pilot project farms are using a combination of nitrogen and NPK fertilisers. Formulations farmers use are limited to the few which the market

offers: NPK 15:15:15, KAN and urea are the most common types of fertilisers used. The application of NPK fertilisers is reserved for the time of ploughing in autumn/winter, and nitrogen is applied in spring for additional feeding of crops. Formulations are never changed, neither vary quantities according to the nutrient status in soil, but are rather adapted to the farmers present budget situation.

Farmers mostly purchase fertiliser immediately before they need to distribute it and therefore pay maximum prices. They distribute it to their crops with classical rotating spreaders of cyclon type. Fertilisers on the market often do not contain nutrients in declared percentage which makes farmers very suspicious. So those which can afford to distribute more will do that rather than take the risk of lower yield.

Farmers have very limited knowledge of balancing nutrition for their crops or about the right timing for spreading fertilisers on the field. Some of them are still wasting enormous quantities of slurry by getting rid of them into local irrigation channels or secretly on neighbours fields and than purchasing lots of mineral fertilisers instead. Even when informed about possible economic benefits, they are not ready to increase spreading efficiency by investing in necessary equipment and save some money on mineral fertilisers.

Pesticides

Pesticides, mostly herbicides, are regularly used on all pilot farms. The main problem is again the lack of knowledge about the right timing, quantities and targeting certain pests/weeds. Farmers do not adapt their intervention according to reality but follow habits instead. The quantities they use are increased because of lack of trust in distributors and producers. During the last 10-15 years the farmers had lots of troubles with the black market for pesticides, which often was the only place to get chemicals. The black market delivered diverse pesticides for a lower price, but also diluted or even false. The other problem connected to pesticides is the irregular control of spreaders and improvisation with equipment which is not working regularly. This is causing lots of inefficiency in crop protection which is obvious on the field. Farmers complain that lack of money is the main cause for this. But this seems to be an excuse since repairs actually often are very cheap and if equipment is properly maintained it can last much longer.

Farmers usually do not care too much about safe storing of pesticides, disposal of cans and packages, neither about protection of themselves during pesticide application. The state has to provide better control of the quality of agrochemicals, so that farmers can start trusting and obeying rules, particularly concerning quantities of pesticides applied. The widespread opinion is that the quality of officially imported pesticides is lower than the one of pesticides produced for the western market, even if they are from the same producer. From time to time inspections still catch even those which are selling chemicals which are forbidden, but those are mostly not used on pilot farms since the forbidden chemicals are predominantly intended for use in fruits and vegetable production.

In the DRP Phase 1 Workshop on Promoting Best Agricultural Practice in the Danube River Basin, 6 – 7 October 2003, Zagreb, Croatia the following was stated on the situation in Serbia:

- Co-operation between the ministries responsible for agriculture and water needs to be improved
- There are many small (approx. 3ha), part-time farms – these need policies designed specifically for them
- The dissemination of information to farmers is critically important
- Need to involve NGOs more effectively
- There is good potential for development of new and more appropriate policies for agricultural pollution control (even some small-scale economic incentives), but greater

access to information is needed to build the knowledge and capacity of policy-makers.

6.7. Ukraine

The current situation of the Ukrainian agriculture and agricultural advisory service is briefly described in the report to this project Using of Agrochemicals in Ukraine - Practice of Nature-Conservative Agriculture, November 2005, by the National Association of Agricultural Advisory Service of Ukraine:

Nowadays issues of nature-conservative and ecological agriculture are not paid a lot of attention to because several factors. As a result of the reformation and passing to market conditions there was considerable falling of the financial level of agricultural production. The level of technological discipline is low. There are large problems with the financial ability to purchase the necessary amount of fertilizers and pesticides. Considerable reduction of cattle and pigs resulted in a sharp falling of the volume of organic fertilizers application. At this time about 70% of all production of meat and milk is concentrated in small personal rural economies, which have 1-2 heads of cattle and 2-3 heads of pigs. This category of agricultural producers is most uninformed in relation to rules of purveyance, storage and spreading of organic fertilizers. Manure-yards are in most cases placed without taking any eco-guard measures into account and as a result there are severe losses of biogenic elements and contaminations of the subterranean waters by nitrates. Results of selective monitoring of wells showed water maintenance of nitrates that exceeds the maximum possible norm by 3-6 times.

Thus at this time issues of ecological safety are actual in rural areas of the Ukraine. However, at State level not sufficient attention is spared on them because of absence of the purposeful financing of measures for solving agro-ecological problems in rural areas.

Informative and consultative support of activities for agricultural producers in Ukraine is very unsatisfactory at this time. Any activities are carried out by Department of Agriculture and Food and in most cases by the agricultural advisory services. The Regional Departments of Agriculture and Food organize two-week educational courses on best agricultural practice, economical bases of economies activity, and work with fiscal and supervisory organs. However, questions of nature protection as a rule are not included in the curriculum of these courses.

The Regional Stations of Plant Protection conduct educational courses as a result of which a certificate and permission to work with pesticides and agrochemicals is given. Courses are intended for the workers of big economies. As a rule farmers do not take part in the courses.

The Agricultural Advisory Service for Ukraine is a non-government organization. Its activity began with technical and financial support of projects of international technical assistance. At this time the Law on Agricultural Advisory Activity, which regulates basic principles of activity in the advisory sphere, was accepted. However, there is no financing of advisory programs from the state, and this fact considerably reduces the possibilities of advisory services and training activities for agricultural commodity producers. The Agricultural Advisory Services conducts regular training seminars, demonstrations, field days which are devoted to the best practice in agricultural production, increasing of profitability and introduction of new progressive technologies. Some of the advisory services this year realized grants projects regarding prevention of nitrate pollution of subterranean waters.

In the DRP Phase 1 Workshop on Promoting Best Agricultural Practice in the Danube River Basin, 6 – 7 October 2003, Zagreb, Croatia the following was stated on the situation in Ukraine:

- Access to information on the causes of agricultural pollution, plus the practical measures and policy options for controlling agricultural pollution is very poor and needs to be improved – in particular, information on what lessons can be learnt from other countries
- Need to develop appropriate “channels of communication” – awareness-raising activities and information packages need to be appropriate to different levels of stakeholder from farmers to policy-makers
- Need to involve more active NGOs as part of the driving force for change.

7. INFORMATION AVAILABLE, INSPECTION AND ENVIRONMENTAL MONITORING

Environmental monitoring systems and inspection are not very well established in the lower DRB countries. A inspection and monitoring system is, however, an important tool to ensure compliance with the law and to observe the pollution status of the environment. The monitoring of the application of BAP on farms applying for financial support schemes should be integrated into a functioning environmental monitoring system.

While the procedures for trade, application and record keeping seem quite straightforward in the DRB countries, in reality the inventories of agrochemicals are not always carried out properly. Even if data systems might be quite comprehensive they can be undermined by the black market for agrochemicals. Information of farmers regarding the risks accompanying the use of agrochemicals without official authorisation and without proper declaration and user instructions from the black market should be part of training and information on BAP.

In order to complement each other it is important that the main institutions concerned with soil and water pollution from agriculture, usually the Ministry of Agriculture and Food, the Ministry of Health and the Ministry of Environmental Protection and Natural Resources along with their subordinated institutes, coordinate their monitoring activities. On regular meetings the responsibilities of the institutions, data exchange and streamlining of the monitoring criteria towards new policies could be discussed. Also the responsibility for monitoring compliance with BAP should be agreed upon for the purpose of approving financial support schemes.

8. CHALLENGES FOR THE INTRODUCTION OF BAP IN THE DRB

In the report of Phase 1 Recommendations for Policy Reforms for the Introduction of Best Agricultural Practice (BAP) in the Central and Lower Danube River Basin Countries an example of the "Mix" of Policy Tools to promote Best Agricultural Practice for the management of manure is outlined.

The approach of this project deviates slightly from the one presented in Phase I. It is based on the following observations from the pilot farms and country-specific traditional, social and economic issues:

- Manure management is the key challenge in relation to BAP for livestock farms.
- Presently the utilisation of the nutrients in the manure for crop production is very low, implying that the majority of nutrients ends as pollution in surface water and groundwater.
- The issues as lined up in Phase I in the "Red Zone" (Discharging manure directly to water courses) and the "Blue Zone" (Restrict manure application to periods of active crop growth etc.) can only be addressed if interventions target the "Green Zone" (Investment in new storage/treatment facilities). It is only through the necessary storage capacity and equipment for spreading manure that the economic benefits in relation to the use of the nutrients in manure for the farms can be realised, so that the nutrients in manure are used for crop production and do not end as pollution.
- Plant protection products are often used in inadequate quantities and kinds, due to a lack of knowledge. The benefit from using plant production products is therefore rather low. Wrongly applied pesticides in high dosages or the use of not registered pesticides are polluting the environment. Spraying equipment is often in a poor condition due to lack of maintenance and adjustment.
- Inadequate storage of plant protection products, cleaning of spraying equipment and disposal of leftover spray solutions are contributing a lot to pollution of surface water and groundwater.

In order to be effective in introducing BAP to the DRP countries the concepts for the application of BAP should include the following components:

National strategy

In order to succeed with introducing BAP it is necessary that each DRB country has a clear and targeted national strategy for water protection that integrates respective laws and different policy measures and shows the necessary path to the achievement of indicated goals. Such kind of national strategy already exists in Bulgaria and will be prepared for Romania on the day of EU accession. The national strategies should not only include the preparation of laws and regulations and adoption of EU directives, but also the definition of the corresponding institutional framework responsible for implementation, regulatory instruments for implementation, a system of monitoring, budgets attached to use of the instruments for implementation, means to boost the capacity of official staff to implement the strategy and means to raise farmers and public awareness about the problem of pollution from agriculture.

Regulatory Instruments and Enforcement

All DRB countries have addressed or are about to address the main agricultural pollution issues by legislation including regulatory instruments in the DRB, with the most extensive coverage of issues in those countries preparing for EU accession.

However, provisions of law, although very explicit in some documents, are frequently ignored by the farmers and some agrochemical companies. The introduction of BAP with the aim to reduce pollution from agriculture require that all farmers, as well as official staff from advising, enforcing and monitoring authorities are well informed about them, that they have the means to implement BAP and that there is a monitoring system to ensure compliance. Country-specific traditional, social economic and reasons for non-compliance have to be addressed in order to succeed. Reasons for non-compliance with the laws are complex and vary between the different DRB countries. Some factors were described for the 7 lower DRB countries in the chapter Country-Specific Traditional, Social and Economic Issues and in the report Analysis of Current Legislation about Fertilizers, Manure and Pesticides, January 2006.

The following list contains the main reasons influencing compliance with laws and low enforcement elaborated as a part of this Project in the Report on Moldovan Legislation and Review of Agrochemical Inventories, October –November 2005. The list are especially true for Moldova, but some aspects are also considered relevant for other DRB lower DRB countries:

- **Quality mix of enforcement tools devised for enforcement of relevant laws.** Enforcement tools are still the ones inherited from the Soviet system more adequate for a regime, with very few concessions to the ones suitable for a democratic state. Thus, fines, penalties, licenses difficult to obtain, bureaucratic barriers against any public initiative are still very much in force, while transparent and clear cut policies for achieving certain objectives in a certain area are very few. Thus, regarding pollution in agriculture, while there are quite a number of laws stating it as an offence, an ordinary citizen would have to spend much time to even get a complaint on soil pollution registered. It is a long distance from here to the respective agency taking action.
- **Motivating rather than prohibitive spirit of the laws.** Dura lex sed lex is very much the only style in Moldova. Over the last years, there are attempts to devise tools encouraging the citizens to comply with the law related to environmental protection, largely through contribution of technical assistance projects. However, these attempts are still very weak and usually do not reach rural communities, where soil and water pollution with agricultural chemicals occurs.
- **Institutional capacity of relevant agencies.** Most of Moldovan governmental ministries, agencies and departments are in a permanent transformation, either being merged, split or transformed into entities with an altogether new status. Senior officials are frequently dismissed for political reasons. The lower rank staff is insecure because of the dramatic staff reductions of the government of all levels over the last decade. This situation discourages performance and discourages staff development and training. Many of the local Ecological Inspectorate and Plant Protection Inspectorate (in districts) are poorly equipped with no computers, no communication equipment except an office telephone and sometimes a fax. The transportation possibilities are difficult, the allowance for fuel very low. The laboratories carry out only a small number of analyses due to lack of funds or improper procedures within the laboratories.
- **Monitoring capacities of relevant agencies.** The Ministry of Agriculture has many subordinate research institutes responsible for environmental monitoring, particularly sampling and analyzing fertilizer and agrochemicals content in soil and food products. However, these responsibilities are carried out to a lesser degree every year due to lack of funds. Thus, the Agrochemical State Service that was formerly monitoring the soil fertility once in five years, are not monitoring this index any longer since 1990. Any fertility data

are now based on data for 1985-1990. The state inspections and laboratories have limited capacity to test and analyze many chemicals, priority pesticides and including POPs, the financial limitations do not allow agencies to improve their data management and communication systems, purchase technical literature.

- **Training of the local staff of relevant agencies.** The staff in most agencies, especially local ones, is mainly middle aged or retirement age that has worked during the Soviet times. It still uses the old approach, in which the institution is central and the customer has to accommodate the institution in every way possible. There are no detailed written procedures to guide the staff in their communication with customers, there is no office manual, no procedures for solution of conflict, no written notices for customers. The officers and inspectors were never trained in communication skills, only some of them speak a foreign language. Participation tools and principles are unknown to most of the staff. The salaries of the staff even after the recent increase are not motivating. An ecological inspector has a monthly salary of about 1,000 lei (about 66 euro) which does not cover even the bill for heating in cold months of the year. All these deficiencies leave much room for ambiguous decision making, corruption and inefficiency.
- **Communication between relevant agencies.** The Ministry of Agriculture and Food, the Ministry of Health and the Ministry of Ecology and Natural Resources are the three ministries that share responsibility for the state of the soils, water, air in the country, as well as for the quality of the foodstuffs produced in the country. The responsibility is allocated among their own departments and among the subordinate institutions. The institutions and department do their share of work and almost never communicate with the other institutions and agencies that carry out the other parts of the job.

Economic Instruments

Economic instruments to ensure the implementation of BAP may be incentives or disincentives and can be an important tools for modifying the management practices of farmers and reducing agricultural pollution. The economic instruments used in the DRB countries are currently mainly disincentives due to the lack of financial resources to introduce incentive schemes.

A crucial issue for the successful implementation of BAP in the lower DRB countries is the storage capacity for manure on farms and technically more advanced equipment for spreading of manure and application of pesticides in the field. Many farmers, however, do not have the economic resources to buy this equipment or to construct appropriate storage facilities for manure.

EU-financing possibilities for incentive schemes for agricultural investments in manure storage facilities depend on the status of the DRB countries in relation to the EU. Accession countries Bulgaria and Romania can receive support for storage capacity for manure from animals and for renovation and construction of new farm buildings for animals, machinery, storage of grain and animal feeds through SAPARD (Investments in agricultural farms) and the Animal Breeding Programme.

Other DRB countries can get financial support for farm investments from technical assistance projects.

Advisory Service/Information

The transfer of knowledge and information to farmers via an advisory service is playing a key role in changing the management practices of farmers and introducing BAP. It is therefore very

important to have a well functioning advisory service system with competent staff and the financial means to conduct the advisory tasks. Some factors to be considered, when extending the capacity of the current advisory services in the DRB countries are:

- Advice and information measures for the introduction of BAP should be designed and part of the National Strategy for reducing pollution from agriculture.
- BAP guidelines for all DRB countries should be developed in correspondence to the country-specific conditions of agriculture and to country-specific traditional, social and economic conditions.
- The capacity of the advisory staff should be increased. It is important that advisors not only improve their knowledge and skills regarding technical and environmental pollution prevention, but also are made familiar with effective training and dissemination methods like for example participatory training.
- Appropriate economic instruments for promoting BAP are important in order to be successful.
- Training and information materials should be written in an understandable way and adjusted to local conditions.
- Awareness of the importance of agricultural pollution control among farmers, advisors and the public are increasing the motivation to adopt the concept of BAP.
- Cooperation between farmers should be encouraged for sharing of the costs of purchasing and maintaining of equipment for manure handling and spraying.

Research and development

- A fundamental necessity for the possibility to calculate the necessary manure storage capacity as well as for the calculation of the plant nutrients in the manure is the availability of national manure standards, which on basis of the most common animal types, housing systems, bedding types and productivity levels describe amount, dry matter content, and content of N, P and K in the manure produced per animal per year or per produced animal, expressed ex. storage. Practice shows, that such manure standards must be developed country wise in order to be precise enough. Unfortunately such standards are not present in the DRB countries.
- It is likewise for the fertilising fundamental that fertiliser norms exist, which describe the economic optimal fertilising of the crops. Unfortunately such norms are not present in the DRB countries.
- The costs for planning of manure storage facility projects with designing, approval procedures, etc. is typically un-proportional high. It would lower the price of such projects considerably if a number of standard designs were developed, which on beforehand had been approved by the authorities.

9. INTRODUCTION AND DEVELOPMENT OF CONCEPTS FOR THE APPLICATION OF BAP

To implement the BAPs that constitute the Pilot Project in the 7 lower Danube Countries the following minimum conditions have to be met:

- BAP guidelines are existing.
- Effective and affordable advisory service able working in close dialogue with the farmers.
- Support schemes for storage capacity for at least 6 months production of livestock manure and equipment for bringing out the manure.

The application of BAP will further be effectively supported by the following:

- Pilot projects should demonstrate that through the application of BAP manure can be used to replace mineral fertiliser, at least partially, thereby contributing to a better farm economy.
- Awareness raising activities are supporting the willingness to change management practices among farmers and the motivation of the advisors and environmental inspectors.
- Support of production methods like organic farming or integrated pest management (IPM) contribute to the reduction of agricultural pollution and increase the awareness for pollution issues and the acceptance of BAP.
- Quality certificates for agricultural production applying BAP will improve marketability of produce and competitiveness.
- Effective pesticide and fertiliser monitoring and control of the black market will ensure the elimination of the use of agrochemicals, that are not authorised because they are environmentally hazardous or polluting.
- Capacity building amongst relevant stakeholders for the implementation of BAP and other agricultural pollution control policies.



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